

Section Life Cycle Management

Book Reviews

Analytical Tools for Environmental Design and Management in a Systems Perspective

The Combined Use of Analytical Tools

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To me, the speed in the development of Life Cycle Assessment seems to be breath-taking. Last year we forgot to celebrate the 10-year jubilee of SETAC's 'Code of conduct' and the Sesimbra Workshop, and nobody reminded the missing reference to this milestone towards standardization. The main stream of the development led to ISO 14040-43, but there were additional activities supporting and complementing this major development: in Europe the 'LCANET' Concerted Action in the Environment and Climate Programme (DGXII) [1], followed soon by 'CHAINET' (12/1997-12/1999), sponsored by the same EU-program.

This book contains the essential results of this program. It took some time to compose the text, to find the best editor, etc. In this case, the series 'Eco-Efficiency in Industry and Science', edited by Arnold Tukker, turned out to be a suitable frame for this work which is still of high topicality; the reason is the still unclear nature of the so called 'tool box' which in Life Cycle Management (LCM) replaces the only standardized assessment method LCA [2,3]. In this book the reader can find a collection of tools which are based on systems or life cycle thinking, albeit at different stages of simplification. Some of the methods analyzed here are based on simplified life cycle inventories, others have been developed for other purposes.

The book contains a critical survey on existing tools for the improvement of the environmental performance of products, services, processes, and companies. It aims at the combined use of these tools and advises which may be the most appropriate instrument or combination. The theoretical part is complemented by three case studies dealing with three important industrial sectors: automobile, electronic consumer goods, and washing of textiles. These case studies by competent experts provide excellent surveys of the specific environmental problems in different sectors of a life cycle or system's perspective. It is a pity, however, that the industries involved did not directly participate in this task. This would have given even more direct information about the use of certain tools from the user's perspective. The authors of the case studies, however, are well acquainted with the industrial chains and aim at stressing the system's aspects. Life cycle thinking prevails in the whole book and LCA (including derived techniques) is given due recognition.

In addition to a detailed description of the tools, which can hardly be found elsewhere, there are three introductory chapters discussing the general aim of the book. Chapter 2 deals with the 'Demands for environmental information' and chapter 3 with the 'Supply of environmental information for decision support'. Chapter 4 'Analytical tools' provides a short

description of the most important tools and a comparison of the tools according to formalized criteria. Chapter 4 is complemented by Appendix D which gives a full description of the tools and is structured according to the following headings:

1. User characteristics
2. Technical characteristics
3. Suitability characteristics
4. Other characteristics

The following 12 methods were analyzed accordingly:

- Life Cycle Assessment (LCA)
- Material Input Per unit of Service (MIPS)
- Environmental Risk Assessment (ERA)
- Material Flow Accounting (MFA)
- Cumulative Energy Requirement Analysis (CERA)
- Environmental Input-Output Analysis (env. IOA)
- Analytical tools for eco-design (matrices and checklists)
- Life Cycle Costing (LCC)
- Total Cost Accounting (TCA)
- Cost-Benefit Analysis (CBA)
- Cost-effectiveness analysis (CEA)
- Multi-Criteria Analysis (MCA)

The three case studies presented in Part II are titled as

- A) The supply, use and waste management chain of electronic consumer goods
- B) Towards reduced environmental burden of mobility: improving the automobile life cycle
- C) The supply, use and waste management of domestic clothes washing

Let's finish with a quotation from the foreword, written by Claude Fussler, World Business Council for Sustainable Development:

"I am wary of heavy books on environmental management. Many are published, few are read, and still fewer make a difference. But this work should prove me wrong. ...It comes down indeed to vision, creativity and heart. The rest, the roadmap to environmental excellence and sustainability, is in this book."

References

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- [2] Klöpffer W (1998): Is LCA Unique? Editorial in Int J LCA 3 (5) 241–242
- [3] Heinrich AB, Klöpffer W (2002): LCM – Integrating a New Section in Int J LCA. Editorial in Int J LCA 7 (6) 315–316

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